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## INTERNATIONAL ECONOMIC RELATIONS

### PROTOCOL WITH BELGIAN-LUXEMBOURG TRADE/ECONOMIC UNION

Moscow EKONOMICHESKAYA GAZETA in Russian No 40, 1979 p 22

[TASS article: "In Favor of the Expansion of Cooperation"]

[Text] The signing of a protocol marked the end of the 7th Session of the Combined Commission for the Economic and Scientific-Technical Cooperation between the USSR and the Belgian-Luxembourg Union (BLES), which was held in Brussels on 17-18 September. The protocol reflected the results of the economic-trade, industrial, and scientific-technical cooperation between the USSR and BLES, and set down the prospects for its further expansion.

The session participants greeted warmly the message sent to them by the Chairman of the USSR Council of Ministers, A. N. Kosygin, in which mention was made of the vital importance of the questions discussed at the session.

General Secretary of the Central Committee of the Communist Party of the Soviet Union, Chairman of the Presidium of the USSR Supreme Soviet, L. I. Brezhnev, it was stated in that message, noted in one of his recent statements that the economic ties among the countries of Europe are becoming more stable and that the long-term economic agreements concluded by the Soviet Union with a number of other European countries "are, as it were, joint capital investments by East and West in a very necessary and mutually advantageous matter -- the preservation and consolidation of international peace."

It was noted in the message that the 1971 trade treaty, which defines the overall principles governing the trade relations between the USSR and BLES, the Soviet-Belgian-Luxembourg agreements dealing with questions of economic, industrial, scientific, and technical cooperation (1969 and 1974), and the 1977 long-term program for the development of cooperation in these areas have become a good basis for expanding and deepening our cooperation, which in recent years has been developing at rapid rates and encompassing newer and newer areas. During the past 10 years the commodity turnover between the USSR and BLES almost quintupled and in 1978 constituted approximately 700 million rubles.

The development of cooperation between the USSR and BLES, undoubtedly, serves the cause of the deepening of detente and is an example of the implementation of the principles of the Concluding Act of the Conference on Security and Cooperation in Europe. A beneficial contribution to that, the message emphasizes, is being made by the Intergovernmental Combined Commission for Economic and Scientific-Technical Cooperation, which marks its tenth anniversary this year. The Soviet government salutes its activities, which are aimed at the further development of the mutually beneficial ties between the USSR and BLES.

Greetings were also sent to the participants in the session by the Prime Minister of Belgium, V. Martens and the Chairman of the government of Luxembourg, P. Werner.

The commission considered a broad range of questions concerning the status and future prospects for the development of economic-trade and scientific-technical cooperation and favorably evaluated its development during recent years. In the course of the session the participants expressed their readiness for the further expansion of relations in these areas, and, in addition, new paths for the development of economic cooperation were discussed.

The 8th Session of the Combined Commission will be held in Moscow in 1980.

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## INTERNATIONAL ECONOMIC RELATIONS

### ECONOMIC TIES OF THE CEMA MEMBER-COUNTRIES WITH DEVELOPED CAPITALIST STATES

Moscow VESTNIK MOSKOVSKOGO UNIVERSTITETA in Russian Seriya 6 (Ekonomika)  
No 5, 1979 pp 56-65

[Article by A. V. Boychenko]

[Text] The present-day level of development of the worldwide productive forces, the internationalization of economic life, a process that is becoming intensified under the influence of the scientific-technical revolution, are leading to the steady increase in the role of the foreign-economic ties in national reproduction. "One of the peculiarities of our time," Comrade L. I. Brezhnev noted in the Report of the CPSU Central Committee to the 25th CPSU Congress, "is the increasing use of the international division of labor for the development of every country, irrespective of its wealth and the economic level that it has achieved. Like the other countries, we are striving to use the advantages that are provided by the foreign-economic ties, for purposes of mobilizing the additional capabilities for the successful resolution of economic tasks and for the gaining of time, for increasing the effectiveness of production and accelerating the progress of science and technology"<sup>1</sup> [Footnotes at end of article].

Socialist economic integration is the chief form of the participation of the CEMA member-countries in the system of the international division of labor. In the Comprehensive Program for the Further Deepening and Improvement of the Cooperation and Development of the Socialist Economic Integration of the CEMA Member-Countries, it is emphasized that "the CEMA member countries, in conformity with the policy of peaceful coexistence that they are carrying out, and in the interests of social progress, as well as proceeding from the assumption that the international socialist division of labor is constructed with a consideration of the worldwide division of labor, will continue to develop their economic and scientific-technical ties with other countries irrespective of their social or state system, on principles of equal rights, mutual advantage, and the observance of sovereignty"<sup>2</sup>.

The scope, nature, and forms of the economic ties among the socialist and capitalist countries, to a large degree, depend upon the direction taken in



development and the stability of the political relations in the world. As was noted in the Report of the Central Committee to the 25th CPSU Congress, "in foreign-economic ties one sees the intertwining of politics and economics, diplomacy and commerce, industrial production and trade"<sup>3</sup>. Coming out consistently in favor of the improvement of the international situation, the CEMA member countries thus are creating the favorable prerequisites for the development of worldwide economic ties. In the development of complete cooperation with capitalist states, the countries in the socialist community see the capability of the practical implementation of the Leninist principle of peaceful coexistence of states with different socioeconomic systems. The broad economic ties create guarantees for stable political relations for the peaceful coexistence of states with opposing social systems. As was emphasized by General Secretary of the CPSU Central Committee Comrade L. I. Brezhnev, the "... stabilize and expand the material base for the policy of peaceful coexistence"<sup>4</sup>.

The development of economic ties among states that belong to opposing social systems is a completely natural process, the objective basis of which is the international division of labor. The necessity of economic relations among countries with different economic systems evolves from the overall laws governing the development of productive forces, from the needs of the latter. V. I. Lenin noted the objective nature of the necessity of developing economic ties between the countries of the two systems: "... it is possible to diverge in various combinations -- it is even extremely likely that we shall have to diverge -- but nevertheless, in the final analysis, this basic economic necessity will clear a way for itself"<sup>5</sup>. Under conditions of the scientific-technical revolution, the process of the international division of labor is intensifying, as are the economic ties between the countries of the two world systems. Under conditions of the scientific-technical revolution the individual countries are unable to create complete multibranch industrial complexes. The products list for industrial production, especially in the branches of machine-building, electronics, and chemistry, is at the present time so great that no single country can guarantee the economically effective mass production of all the output produced in the world. International specialization and cooperation are becoming a necessary condition for the achievement of the high effectiveness, quality, and technical equipping of production.

The complete set of the most vitally important problems of modern-day life, such as the raw-materials and power protection of the environment, the elimination of the most dangerous mass diseases, the mastery of space, the study of the World Ocean and the use of its resources, is of a global scale. The resolution of each of these stupendous tasks requires the long-term, coordinated, and purposeful activity of many countries, and this increases the importance of developing economic relations between the socialist and capitalist countries within the system of the worldwide economic ties during our day and in the future.

The 1970s are entering international life as a period of the confirmation, in the practical situation of international relations, of the principles of

the peaceful coexistence of states with different social systems, as a time of deep changes in the political sphere in favor of the peace-loving democratic, progressive forces. The culminating moment in the process of detente was the successful conducting of the Conference on Security and Cooperation in Europe, thanks to the tremendous efforts and the active peace-loving policy of the USSR and the other countries of the socialist community. The signing of the Concluding Act of the European Conference in Helsinki was the summing up of the results of the positive shifts that had occurred in the world in the recent period, and simultaneously was the base for the further expansion of the political and economic contacts among the countries participating in the European Conference.

Real prerequisites for the effective mutually advantageous cooperation in the field of the economy, science, and technology between the socialist and the developed capitalist countries are being created as a result of the rapid development of the productive forces in the socialist countries, the growth of their industrial and scientific-technical potentials. In the Report of the CPSU Central Committee to the 25th CPSU Congress it was noted that, "The countries of socialism are playing an increasingly significant role in the world economy as well. The socialist community has now become the most dynamic economic force in the world"<sup>6</sup>.

The desirability of expanding and strengthening the economic ties between the countries of socialism and capitalism is determined by the fact that they make it possible to extract more completely the benefits inherent in the international division of labor. The CEMA member countries have a self-interestedness in importing from the developed capitalist countries modern machinery and equipment, advanced technology, licenses and technical knowledge, as well as in the purchases of complete enterprises, especially in branches that are directly linked with the acceleration of scientific-technical progress. The countries in the socialist community also import certain scarce raw-material and consumer commodities which cannot be obtained in the necessary volume on the world socialist market, and also have a self-interestedness in the use of the production and scientific-technical experience of the developed capitalist countries for purposes of increasing the effectiveness of social production. It must be said that the economic ties with capitalist countries play only an auxiliary role in raising the technical level of production in the socialist states, in the acceleration of scientific-technical progress and national-economic development. The fundamental problems of increasing the effectiveness of social production are resolved by mobilizing the domestic resources in proportion to the further implementation of socialist economic integration. The capabilities and scope of the economic ties with the capitalist countries, for the most part, are determined by the results of the socialist economic integration and by its effectiveness.

The business circles in the capitalist countries are demonstrating a greater and greater self-interestedness in developing economic ties with the socialist countries. The unevenness of the economic development of the capitalist countries and the intensification of the competitive struggle on

the world capitalist market; the periodically exacerbated crises of over-production, further aggravated by raw-material, fuel-and-energy, and currency-finance crises; the tremendous extent of unemployment in the industrially developed capitalist countries act as factors that exert a direct destabilizing influence upon the functioning of the system of the production relations of capitalism as a whole. At the same time, those factors are among the reasons for the persistent need on the part of the capitalist countries to provide themselves with new sales markets, to create additional jobs by developing the export branches, and to obtain access to sources of supply for industrial commodities and the output of the fuel and raw-materials branches, to additional sources of the latest scientific-technical ideas. This serves for the capitalist countries as an effective incentive for developing economic relations with the countries of the socialist community. It has been computed that during the production orders with the CEMA member countries alone, the West has been provided in recent years with employment for 2-2.5 million persons<sup>7</sup>. One can easily see what great importance this has under present-day conditions, when in the developed capitalist countries alone, in the autumn of 1976, there were 15 million persons unemployed. According to information provided by the International Labor Organization, the level of unemployment in the countries of the West will remain high until 1980<sup>8</sup>.

During recent years one has observed qualitative changes in the international economic ties, which have manifested themselves in the tendency toward the gradual predominance of the relations directly in the production sphere over cooperation in the sphere of exchange. However, the dominant form of the East-West economic ties continues to be trade. The increase in the reciprocal self-interestedness in the development of economic ties and the improvement of the trade-policy conditions in the relations between the socialist and capitalist countries have contributed to the considerable development of their reciprocal trade ties. The commodity turnover between the two groups of countries increased from 4.9 billion rubles in 1960 to 44 billion rubles in 1976, that is, increased by a factor of almost 9. Obviously, the increase in the physical volume of commodity turnover, computed on the basis of fixed prices, was less. The world index of export prices of all commodities rose between 1960 and 1976 by a factor of 2.5, and during the 1970-1976 period alone, a factor of 2.2. However, even when considering the increase in prices, the rates of increase in the trade between the countries of the East and the West substantially outdistanced the dynamics of world trade as a whole<sup>9</sup>. The commodity exchange between the European socialist and capitalist countries was converted into one of the most active sectors in international trade and is increasing at rates that exceed by a factor of 1.5 the growth rates of world trade as a whole. During the past ten years the share of the commodity exchange between East and West in world trade has increased from approximately 2 to 4 percent.

In recent years the trade between the CEMA member countries and the EEC states has been developing especially rapidly. During 1971-1975 the commodity turnover between the CEMA member countries and the Common Market countries

approximately tripled and constituted more than \$80 billion<sup>10</sup>, that is, the annual increase exceeded 25 percent<sup>11</sup>. By 1990, according to existing estimates, the share of the European CEMA member countries in world trade will constitute no less than 15 percent<sup>12</sup>.

The development of trade with the capitalist states is one of the reasons for the increase in their participation in the foreign-trade turnover of the CEMA member countries. The share of the developed capitalist countries in the total foreign-trade turnover of the CEMA member countries increased from approximately 22 percent in 1960 to 29 percent in 1977.

During recent years there has been a fundamental change in the economic cooperation between the countries in the two world systems. Many capitalistic countries have relaxed their discriminatory limitations on trade with the socialist countries, have brought the credit terms closer to the normal ones, and, on the whole, have taken a long-term approach to the development of reciprocal cooperation, a process of which the Soviet Union and the other socialist countries are invariable proponents. The volume and structure of trade, however, between the CEMA member countries and the developed capitalist states do not in all instances correspond to the capabilities which are opened up by the present-day level of economic and scientific-technical development. The conversion of the potential opportunities for the mutually advantageous cooperation between the socialist and the developed capitalist countries into a reality is linked with the overcoming of the obstacles standing on the path of the expansion of the economic ties between the East and West. Those obstacles are: the retention of the discrimination in the foreign-economic policy of the capitalist states and groupings with respect to the socialist countries; the attempt of the Western countries to force unequal conditions on the socialist states, to link the establishment of normal conditions for trade and economic cooperation with political conditions that do not have anything in common with questions of trade relations. The list of "strategic commodities" that are not to be exported to the socialist countries, which list was established by the functioning Coordination Committee (COCOM), has not yet been eliminated (although it has been substantially reduced). The principle of the most favored nation is being violated by all the developed capitalist countries in trade with the USSR and the other socialist countries. In the United States, for example, as a result of the failure to extend to the socialist countries the ordinary terms pertaining to treatment as the most favored nation, the promising items in their export are subject to import duties at rates that exceed by a factor of 3-4 the duties for the output of competitors in other countries. The discriminatory conditions, factually speaking, make the American market inaccessible for the output of the majority of the branches of the processing industry of the socialist countries, and this is retarding the development of their trade with the United States. Certain American experts, for example, feel that the restoration of normal trade conditions can double the American import from the socialist countries<sup>13</sup>. The normal development of trade between the CEMA member countries and the United States is also hindered by the discriminatory trade law that was adopted in 1974 by the U.S. Congress, in conformity with which the conditions for the most favored nation in trade



is granted to the socialist countries for a very limited period of time: for 1.5 years from the day of adoption of the law (with the right to extend for the subsequent 12-month periods), subject to Congressional approval. Instead of unconditional terms as the most favored nation, Congress stipulated definite conditions of a political nature before they could be granted. The USSR is the only country with respect to which a maximum amount of credit has been established (\$300 million for four years). This same principle with regard to a limit on credit has become part of the law extending the powers of the U. S. Export-Import Bank<sup>14</sup>.

An unfavorable influence is also exerted upon the development of trade relations with the CEMA member countries by the Common Market customs-tariff terms. The rates for the uniform EEC customs tariff were constructed in such a way as to encourage the importation into the EEC chiefly of unprocessed commodities having low value. For finished industrial articles, including machinery and equipment, the rates of the customs tariff that were established are high, and the size of rate is in direct proportion to the degree of processing of the articles. This creates great difficulties for the socialist countries, a considerable part of whose exports to this region is made up of finished industrial articles. In conformity with the 1972 EEC decree, the customs levied on the importation of semi-finished goods constitutes 9 percent, and finished articles have higher rates of customs levied on them. For example, the import duties on machinery and equipment have gone as high as 14 percent, and on consumer commodities from 12.5 to 16 percent<sup>15</sup>.

A detrimental effect upon the development of trade between the socialist countries and the Common Market participants is exerted by various barriers of agrarian protectionism which were put on the path of exporting agricultural commodities from the socialist countries to the EEC market. The working out of a common agricultural policy for the EEC was accompanied by the introduction of increased import duties on agricultural commodities from "third countries." The agricultural commodities arriving on the EEC market from the socialist countries are subjected to compensatory assessment that is equivalent to import duty of 35 percent. In addition, the compensatory assessment changes every year. This kind of discrimination is applied to as much as 80 percent of the export of the agricultural output of certain socialist countries<sup>16</sup>. The high level of duty levied on the output of the agriculture of the socialist countries when exported to the Common Market decreases the proceeds from that export and reduces its effectiveness.

For the further development of reciprocal trade on a balanced basis, it is becoming a persistent objective necessity to assure that the Common Market countries take steps for the further reduction, and subsequently the complete elimination, of all trade and nontrade barriers. Approximately 240 commodity items in the EEC uniform tariff have not been liberalized for the socialist countries and approximately 100 have been only partially liberalized<sup>17</sup>.

A new step on the path of discrimination against the socialist countries

has been the decision to have the EEC countries apply a "uniform trade policy" with respect to them. The Common Market countries, on a unilateral basis, abrogated the bilateral agreements that were in effect until 31 December 1974, which regulated the trade-policy and legal conditions governing the trade between the socialist countries and the EEC states. Effective 1 January 1975 the socialist countries, individually, were supposed to conclude trade agreements directly with the European Communities Commission, which acts in the name of the entire community<sup>18</sup>. The Common Market countries thus attempted to oppose to individual socialist countries a closed integrational bloc, which would provide the EEC with the opportunity to carry out with respect to them a differentiated policy for the purpose of causing a schism in the socialist community. The EEC thwarted the attempts of the CEMA member countries to conclude bilateral agreements with individual EEC members. As a result, the foreign-trade ties between the CEMA member countries and the Common Market are carried out at the present time on a nontreaty basis.

The present-day status of the economic relations between the CEMA member countries and the West makes it a persistent necessity to intensify the coordination of the actions of the CEMA member countries and to have them conduct a coordinated political and economic course with respect to the capitalist countries.

In fighting to implement the principles of the Concluding Act of the Conference in Helsinki, the CEMA in February 1976 came forward with the proposal to conclude an agreement between the CEMA and the CEMA member countries, on the one hand, with the EEC and the EEC member countries, on the other hand, concerning the principles governing the interrelations between them. A draft version of the proposed agreement was submitted to the administrative agencies of the EEC; that draft stipulates the granting of the status of most favored nation to all participants, the development of their trade and economic relations on a nondiscriminatory basis, and the abolition in this connection of all prohibitions or limitations on the import or export of any commodity; the reciprocal trade in various commodities on a scale that does not impair the domestic markets of the participating countries; the study of the currency-financial questions for the purpose of finding solutions contributing to the stable growth of commodity turnover and the reciprocal granting of credit on the most favorable terms; the increase in the trade in agricultural products on a stable, long-term, and just basis. At the same time, the draft stipulates the development of relations between the CEMA and EEC in such areas as standardization, the protection of the environment, statistics, and economic forecasts in the area of production and consumption in accordance with coordinated subject matter. As was noted at the 31st Session of the CEMA in June 1977, the agreement "would promote the materialization of the detente and the reinforcement of peace in Europe in the spirit of the principles of the Concluding Act of the Helsinki Conference"<sup>19</sup>.

It should be noted that the considerable reserves for expanding the foreign-economic ties between the CEMA member countries and the capitalist countries

are influenced by the planned development of the socialist economy. Important tasks confront the CEMA member countries in increasing the degree of processing of the exported raw materials, various kinds of which will continue in the long term to be a considerable item of Soviet export and the export of certain other socialist countries to the capitalist states; in improving the structure of export to the capitalist countries by increasing in it the share of machinery, equipment, and other finished articles that are effective from the point of view of currency proceeds. The share of the socialist countries in the world export of machinery and equipment in 1975 constituted 10 percent, and the share of the developed capitalist states, more than 87 percent<sup>20</sup>. The increase in the effectiveness of export to the capitalist market is inseparably linked with the increase in the competitive capabilities of the export output of the socialist countries, with the improvement in the organization of services and post-sale technical maintenance, and the advertising activities of the socialist countries.

The international economic ties under conditions of the scientific-technical revolution have a tendency toward the development of comprehensive economic ties which encompass, in addition to trade, the production and scientific-technical fields as well. In the early 1970's the economic cooperation between the CEMA member countries and the West achieved a qualitatively higher phase of development, which is characterized by the establishment and development of long-term, large-scale economic and scientific-technical cooperation on a bilateral and multilateral basis. This was one of the reasons for the creation of a fundamentally new treaty-law base for the socialist countries with the countries of the West, which socialist countries were constantly concluding long-term (principally ten-year) intergovernmental agreements dealing with economic, technical, and industrial cooperation<sup>21</sup>, and also the elaboration, on their basis, of concrete long-range programs. Especially great importance is currently attached to the further elaboration of a foreign-economic strategy which would take into consideration the needs, domestic capabilities, and the preservation of the security of the countries in the socialist community.

One of the progressive trends in the cooperation between East and West is the establishment of industrial cooperatives and specialization. At the present time the number of agreements dealing with cooperatives and concluded between the European CEMA member countries and capitalist firms exceeds 1200<sup>22</sup>. The number of agreements dealing with industrial cooperatives during the past four years increased at a rate 1.8 times faster than the volume of trade<sup>23</sup>. In first place, according to data provided by the United Nations Economic Commission for Europe, based on the number of concluded treaties among the countries in the socialist community is Hungary (29.6 percent of all treaties between the CEMA member countries and the West); recently Poland has approached that country (25.8 percent). Of the Western countries, the ones with the largest number of treaties are West Germany (25.5 percent); France (16 percent), and Austria (11.8 percent). Recently there has been an intensification of the activities in this direction by the companies of the United States and Japan<sup>24</sup>.

The basic branch in which industrial cooperation with Western firms is being carried out is machine-building, the share of which is approximately 30 percent of the number of agreements dealing with cooperatives. The share of the electrical-engineering and electronic industry is 11.6 percent; and transportation means, 15 percent of the total number of agreements. Cooperative ties with Western firms are also carried out in metallurgy (7.4 percent of the total number of cooperative agreements) and the chemical industry (17.5 percent)<sup>25</sup>. The share of the branches that were listed is more than 80 percent of the total number of treaties; and the remaining treaties pertain to light and food industry and agriculture (in the production of output put on an industrial basis), and the area of the reinforcement of the material base for the development of tourism.

The industrial cooperation between the socialist and the developed countries is carried out in various forms: the formation of production cooperatives on the basis of the use of licenses, when their value is repaid by shipments of the output manufactured on the basis of those licenses; cooperative shipments of complete equipment for enterprises, with the payment for their value being made from the output produced at that enterprise; cooperative shipments of parts, assemblies, and other components for the assembly and production of finished output; the joint carrying out of research to assimilate new types of output, the production and sale of finished output; joint operations on the markets chiefly of the developing countries (the construction of modern production capacities in the developing countries, etc.; the sale of finished output). These forms of cooperation do not encompass the variety of agreements dealing with the formation of cooperatives and do not provide a complete picture of cooperation in the field of production. In practice one frequently encounters a combination of the elements of a particular form or its intertwining with other types of cooperation, primarily with scientific-technical cooperation.

During recent years there has been rapid development of such a type of production cooperation as large-scale production programs on a compensatory basis, which are an important step forward in using the advantages of the international division of labor. Agreements on a compensatory basis presuppose the participation of foreign firms in the development and construction of complete projects. These agreements stipulate the granting by the foreign partner of long-term credit, and the delivery, against that credit, of machinery and equipment, scientific-technical documentation, and materials for the construction of large-scale industrial projects, which are repaid by the output from the constructed enterprises or by raw materials from the assimilated sources of natural resources in a volume completely covering the total amount of credit granted, including the interest on a long-term basis (as a rule, 10-15 years). The share of the output to be exported by way of compensation constitutes 20-30 percent of the volume of production.

The share of that form of cooperation is 28.8 percent of the cooperative ties between the CEMA member countries and the Western states: USSR (69.5 percent of all agreements dealing with the formation of cooperatives with



capitalist firms), Bulgaria (42.9 percent), and East Germany (42.8 percent)<sup>26</sup>.

The number of agreements on a compensatory basis is constantly growing. Whereas in 1973 the Soviet Union had only three such agreements with capitalist countries, at the present time the number of such agreements providing for the shipment to the USSR of equipment and materials for more than 60 industrial projects in the chemical and petroleum-drilling industry, the petroleum-gas, timber and paper-and-woodpulp, ferrous and nonferrous metallurgy, and the coal industry, with a total value of several billion rubles, exceeds 30<sup>27</sup>. As can be seen, these transactions have become most widespread in the fuel and raw-materials branches, since the development of natural resources, especially in the remote parts of the country, requires especially large capital investments that extend over a prolonged period of time.

The new and promising forms of foreign-economic ties "which go beyond the confines of ordinary trade, greatly expand our capabilities, and provide, as a rule, the greatest benefit"<sup>28</sup> include scientific-technical cooperation. The scientific-technical ties between the CEMA member countries and the Western states are carried out in various forms, the basic ones of which are: cooperation in the field of scientific-technical information; the organization of symposia and conferences dealing with individual problems of science and technology; cooperation in the training of scientific-technical personnel. Almost all forms of cooperation have been converted to a long-term stable basis thanks to the concluding of corresponding agreements with the governments and companies in the capitalist countries. By the mid-1970's there was established a system of long-term inter-governmental agreements among the European states. According to data provided by the United National Economic Commission for Europe, from 1965 through 1975 the number of agreements dealing with scientific-technical cooperation between the East and West increased from 100 to 1000. Every year the number of such agreements increases by approximately 100<sup>29</sup>.

One of the leading forms of the scientific-technical cooperation between the CEMA member countries and the Western countries is license trade. The turnover of license trade is growing at a rate that is 2-3 times faster than the foreign-trade turnover. The CEMA member countries at the present time occupy solid position on the international license market, acting in that market both as exporters and importers. The achievements of the USSR and other CEMA member countries in the field of space and nuclear research, metallurgy, electrical engineering, welding, certain trends of machine-building and instrument-building, chemistry, and other branches are widely used in many countries throughout the world. The purchase by the CEMA countries of licenses and know-how in the West is promoting the acceleration of the rates of scientific-technical progress, the saving of material expenditures and time, and the raising of the technical level of production and the quality of the output produced, including that intended for export.

In recent times one form of cooperation that has become firmly established in the practice of international cooperation between the CEMA member countries

and the developed capitalist states is that which involves the carrying out of large-scale joint scientific research and the use of the obtained results, although there exist here definite organizational difficulties that arise in the process of preparing and conducting the joint research and development. Scientific-technical cooperation creates the opportunities for combining the advantages of the CEMA member countries in the sphere of fundamental research with the experimental and production capabilities of the Western partners, for the purpose of bringing the scientific backlog effectively to broad practical use.

The effective use of scientific-technical cooperation with the developed capitalist countries is an additional factor for accelerating the scientific-technical progress in the CEMA member countries. But the factor that remains the chief one is the intensification of the countries' own research in the area of science and technology and the use of the advantages and benefits of the socialist economic integration of the CEMA member countries in this area.

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## MANPOWER: LABOR, EDUCATION, DEMOGRAPHY

### FLAWS OF WAGE SYSTEM IN CONSTRUCTION DESCRIBED

Moscow TRUD in Russian 5 Aug 79 p 2

[Article by Candidate of Technical Sciences I. Komarov: "The Criterion is the Final Result"]

[Text] ...On the basis of employing long-term wage rates per ruble of product, to strengthen the dependence of the wages of each worker and the labor collective as a whole upon the growth of labor productivity and improving the end results of the operations of the production associations (enterprises).

From the Decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Effect of the Economic Mechanism on Improving Production Efficiency and Work Quality."

The Decree of the CPSU Central Committee and the USSR Council of Ministers outlines a broad program of measures to accelerate the completion of production capacity and projects, and to improve the organization of capital construction. There is also provision to improve the material incentive system on the basis of applying long-term wage rates per ruble of product.

In preparing to convert to the new system of economic indicators, it is important to disclose the existing shortcomings in order to exclude the possibility of their repetition in the future. This applies particularly to the calculating of wages for construction workers.

At certain construction sites today, unfortunately the following picture has become customary: at the end of the month the work superintendent turns over to the foreman a sheaf of orders for calculating and on which the total daily earnings have already been written in in pencil. Thus, the foreman should determine not the actual wages, but rather calculate the volume of supposedly performed work on the basis of the daily earnings set at the

discretion of the work superintendent. That is, everything is turned upside down. Distortions and "hand-downs" at present are becoming an almost customary phenomenon in construction. And this can be seen, in particular, from statistics.

Last year the average wages for workers in construction were 194.9 rubles a month. Of course, in and of itself this figure means nothing. In order to get to the essence of the question, let us first trace how wages and labor productivity have increased in construction, for example, over the last 14 years. As an annual average output per worker has increased by 4.54 percent. Calculations indicate that a 1 percent rise in labor productivity should be accompanied by an increase in wages for the workers by not more than 0.5-0.6 percent. From this it follows that over the same 14 years, wages should have increased by 2.7 percent per year. But in actuality the average annual increase in wages was 4.6 percent, that is it greatly outstripped the rate of the increase in labor productivity.

But this is only a part of the question. It is much more important to know to what degree the output by which labor productivity was determined corresponded to actuality. That is, how much did the worker do and how much was entered in the wage order. Here analysis discloses an interesting picture. Judging from the paid orders, the overfulfillment of the rates during the 14 years averaged 45.7 percent in construction. But what happens if we calculate not rubles and not the expended money, not the value of the work, but rather physical indicators such as how many cubic meters of bricklaying, stuccoing, and how many tons of structural installation were performed by one worker in one day? It turns out that the output in physical indicators per worker engaged in the basic types of jobs over this period rose by just 0.8-15 percent, and in concrete and reinforced concrete jobs even declined by 1.4 percent. How then did the overfulfillment of the rates by 45.7 percent occur?

The answer is well known: by the incorrect application of the rates and by distortions. This is affirmed by the data of 85,000 checks made last year. The average level of fulfilling the standards was 99.3 percent. But judging from the paid orders, the average fulfillment of the rates was 135.1 percent.

This discrepancy shows that the role of wages as an active element in production has been significantly reduced at many construction sites, and the direct link is often broken between the quantity and quality of the construction product and the wage level.

What is the source of the distortions in the orders? Basically they are due to surplus amounts of ancillary-auxiliary and unproductive work. Research has shown that the share of such "fictitious" jobs for the paid orders last year averaged 34.1 percent. For this reason the average wages of piece workers were overstated by 28.4 percent. If the wages were not inflated, then they would have been 130-140 rubles a month, that is the lowest of all the industrial sectors.



The rate system existing in construction has not been revised for 10 years. During this time actual wages have increased and the rate system no longer conforms to them. The proportional amount of the rate in total earnings in 1969 was 85-90 percent. At present the rate is only 51 percent, and this is not normal.

Everyone understands this. This can be seen from the fact that in planning the wage fund, they proceed from the average monthly earnings of 190 rubles (and not 130-140). Thus, it is a question of bringing the rate system into agreement in order to exclude the distortions and "inflated" figures for overfulfilling the rates. This system of distortions is basically bad, it causes enormous moral harm and legitimizes deceit.

Such a practice is particularly dangerous in the fact that it, in creating the illusion of apparent well-being, morally warps the engineers, technicians and workers. For the wage violations are used not only to compensate for the decline in the earnings of the workers due to actually objective difficulties, but in many instances also conceal the results of the unproductive organization of construction, losses of working time, weak labor and production discipline, and the irrational and inefficient use of material and labor resources.

The distortions also reduce the effectiveness of economic incentives. The encouraging of work quality provided by the job wages has virtually no effect, and under the conditions of mass distorting of the schedules makes no sense.

The distortions and the inflating of wages for the workers prevent the spread of the brigade order and job wages in construction. The brigades which have been converted to an order or job wages and which have improved their work end up under disadvantageous conditions, since for them the share of the surplus amounts of auxiliary work and consequently wages is significantly reduced in the orders.

What measures are required to strengthen the effect of the economic levers and incentives and put an end to the distortions in accord with the decree of the CPSU Central Committee and the USSR Council of Ministers? First of all, it is essential to improve the rate system as was already mentioned. On this level the USSR Goskomtrud [State Committee for Labor and Wages] should prepare its own proposals. At the same time it is essential to adjust the current statute governing job wages in the area of paying bonuses to workers for completed construction products and overfulfilling the set quotas for physical output.

A great effect will also be provided by planning the wage fund for construction and installation organizations not from the "base" or from the achieved level, as is presently done, but rather on the basis of the labor expenditure rates. In this area interesting experience has been acquired at the Saratov Housing Construction Combine of Glavprivolzhskstroy [Main Volga

Construction Administration] of the USSR Ministry of Construction. Here they have converted to the new form of job wages on the basis of consolidated comprehensive production rates. The main thing at present is the end product of the brigade, that is, the complete range of construction and installation work carried out by it. Wages for the jobs performed are figured in percent of the volume of end product. Thus it has been possible to eliminate the distortions in the ancillary-auxiliary jobs.

The number of standards has been sharply reduced (at the combine, just 200-250 standards are used). The varying interpretation of the standards and the variability of their application have been excluded, and the wage conditions for equal jobs have been evened out.

There has been a fundamental change in the system of issuing the quotas to the brigades. Instead of orders the brigades receive (simultaneously with the foremen) work plans for the year and for the month, and these have replaced the ordinary work orders. The plans are issued in an accessible form. Each worker of the combine knows his task for the forthcoming month.

The brigades which have converted to the new wage form have increased labor productivity, they have begun to work with greater intensity, and have become smaller in size. Labor discipline has risen, and instances of violating timekeeping have been excluded. Wages are paid only for actually worked time. The workers themselves make certain that there are no distortions in the timesheet and wages are allocated according to the actually worked man-days.

For compensating for wage losses by workers due to objective difficulties or outside problems, the leadership of the construction organization has available a certain reserve of 2-10 percent of the wage fund. This guarantees the dependability of the new wage form.

At present a search is underway for variations to apply progressive wage forms. Obviously the USSR Gosstroy and the Goskomtrud together with the construction ministries must study the acquired experience and broaden the practice of applying the wage system on the basis of consolidated comprehensive production rates, and work out the procedural and normative documents for the wide introduction of this system.

In conclusion I would like to emphasize again that the problem of improving rate setting and wages for workers in construction is extremely acute. And it must be solved in the immediate future. It must be solved in a manner so as not to jeopardize the interests of the workers and so that the money which the construction worker receives is actually earned.

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## MANPOWER: LABOR, EDUCATION, DEMOGRAPHY

### STATUTE ON JOB WAGE SYSTEM IN CONSTRUCTION

Moscow STROITEL'NAYA GAZETA in Russian 19 Aug 79 p 3

#### [Article: "Statute on Job Wages in Construction"]

[Text] In accord with the Decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures to Further Improve the Training of Skilled Personnel and to Retain Them in Construction," the USSR Gosstroy, the USSR Goskomtrud [State Committee for Labor and Wages] and the AUCCTU have approved the "Statute Governing Job Wages in Construction."

The text of the statute is published below.

1. Job wages are to be the basic form of wages in construction, and are to be introduced for the purposes of strengthening the material incentives for the workers, raising labor productivity, providing the required quality and reducing the construction time of the projects.

The current statute is to be extended to piece workers of construction and installation organizations as well as to piece workers engaged at construction projects being carried out by the direct labor method, regardless of the departmental affiliation of these organizations.

2. Prior to converting the workers to the job wage system, the leaders, engineers and technicians of the construction and installation organizations should carry out a range of measures which provide careful engineering preparation of production, including: material and technical supply of the work areas in accord with the work schedules and the calendar dates for completing the work, as well as familiarizing the workers with the basic provisions of the job wage system.

The work superintendents and the foremen of the production areas should ensure the prompt delivery of building materials, structural elements and equipment to the work areas, they should supervise work quality and the complete fulfillment of the job quota.



With job wages, proper accounting should be ensured for the amount of work performed and the actually worked time.

3. The quality of the work performed should correspond to the requirements of the plans, the Construction Standards and Rules, and the other normative documents.

The evaluating of the quality of the performed work and its acceptance from the executors are carried out in accord with the instructions approved by the USSR Gosstroy for assessing the quality of construction and installation work (Construction Standard 378-77).

The violations committed by a brigade (team or worker) in the requirements made upon the quality of the performed work should be eliminated by them within the calendar time established for fulfilling the job quota without additional pay.

4. The job quotas are issued to the brigades (teams, workers) on the basis of calculating the labor expenditures and wages as approved by the leader of the construction and installation organization, the capital construction department (administration), or by the enterprise leader.

The calculations are drawn up, as a rule, using the consolidated standards and rates worked out by the TsBNTS [?Central Bureau for Labor Norming in Construction] under the All-Union Scientific Research and Planning Institute for Labor in Construction Under the USSR Gosstroy and by the norm research organizations of the ministries and departments, considering the progressive construction methods, the maximum mechanization of the jobs, and the scientific organization of labor and advanced experience. In exceptional instances, for compiling the calculations, uniform, departmental and local standards and estimates can be used.

5. The job quotas are issued to the brigades (teams, workers) for the amount of work as a whole for the project, its stages, parts, production complex or type of work.

In the calendar period for carrying out a job quota, as a rule it is not permitted to issue other (including additional) quota-orders to a brigade (team or worker).

6. The calendar date for carrying out the job quota is set by the work superintendent\*, proceeding from the work schedule (calendar or network) and the possible shortening of the normed time by the brigade (team or worker).

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\*By the foremen, when the foreman's section is directly subordinate to the construction or installation administration (or equivalent organization), to the capital construction department (administration), or the enterprise.

The set calendar date for carrying out a job quota cannot be extended, with the exception of instances when, in line with the necessity of observing the current work rules in the open air (the Construction Standards and Rules, the Rules Governing Work in the Open Air During the Cold Season, and so forth) there have been entire-shift breaks in the work due to the weather and climatic conditions, and the workers have been temporarily transferred to other jobs or have been idled.

In these instances, under the condition of the proper accounting of the break time, the period of carrying out the job quota upon the submission of the work superintendent (foreman) is extended by the number of days of the interruption by the leader of the construction-installation organization, the capital construction department (administration) or the enterprise leader.

7. In carrying out a job quota on time or ahead of time, in meeting the quality requirements for the job, the brigade (team, worker) can be given a bonus for reducing the stipulated time.

For the purposes of encouraging a high quality of work in carrying out a job quota on time or ahead of time, differentiated amounts of bonuses are set for each percentage of shortening the designated time: up to 3 percent of the piece rate according to the job order with a quality evaluation of "excellent" for the work performed, up to 2 percent with an evaluation of "good," and 0.5 percent with "satisfactory."

With a planned duration for carrying out the job quota over 1 month, the designated bonus, under the condition of observing the work schedule, can be paid monthly as an advance, but not more than 50 percent of the established amount of the bonus under the job quota.

The final settlement for the job quota is carried out after the fulfilling and accepting of all the jobs provided for by this quota.

8. The specific amount of the bonus within the limits set in Point 7 is set by the leader of the construction-installation organization, by the chief of the capital construction department (administration) or by the enterprise leader with the approval of the trade union committee, considering the intensity of the quota, the weather and climatic conditions, the complexity of work to be carried out, and other factors.

The maximum amount of bonus paid under the current statute should not exceed 40 percent of the total piece earnings under the job quota.

With the nonfulfillment of the job quota by the established date, the performed work is paid for without figuring any bonuses using the job order.

9. In determining the amount of the shortening of the designated time under the job quota for figuring the bonus for the brigade (team, worker),

the entire shift time under the work schedule is considered as actually expended, including overtime and work on holidays permitted under the authorized procedure, minus the time of regular and additional leaves (including training), pregnancy and maternity leaves, leaves without pay, official trips, temporary disability, entire-shift shoppages not due to the fault of the brigade (team, worker), additional work breaks given in the working time in accord with labor legislation (to women for nursing children, to workers for warming or the complete halting of work with reduced temperatures), or carrying out state and social obligations during working time, and the time for which, in accord with the decision of the USSR government the duration of the working day or workweek is shortened for persons successfully studying on the job.

Absences without leave are to be included in the actually worked time.

10. The allocation of the bonus in the brigade (team) is carried out according to the categories assigned to the workers and the time worked. It is permitted to allocate the bonus considering the individual contribution of each worker to the collective results of the labor within the procedure set by the leader of the construction-installation organization (enterprise) and the trade union committee, with the approval of the brigade.

11. The bonuses for the workers are approved by the leader of the construction-installation organization, the capital construction department (administration) or by the enterprise leader upon submission of the foreman (work superintendent).

The leaders of the organizations (enterprises) who approve the bonuses are given the right to partially or completely deprive individual workers of bonuses in the procedure and on the grounds set by the Statute Governing Bonuses in the organization (enterprise).

12. Bonuses are paid to workers who have worked an incomplete month because of induction into the USSR Armed Forces, transfer to another job, admission to an institution of learning, retirement on pension, dismissal because of a cutback in personnel and for other valid reasons, as well as to workers who have been newly hired considering the time actually worked by them in the given month according to the job quota.

13. The bonuses for piece workers are added to the piece earnings according to the basic piece rates and to the extra pay for night work. For work on holidays and for overtime, bonuses are added to the earnings at the ordinary piece rates.

14. Bonuses paid to the workers under the current statute are paid from the wage fund.

15. Bonuses are paid to the workers by the organization where the given workers are on the listed personnel, and to workers sent out for carrying out construction, installation and adjustment work, by the organization for which this work is considered in its plan fulfillment.

## TRANSPORTATION

### USE OF PROGRESSIVE TYPES OF TRANSPORT URGED

Moscow PLANOVoye KHOZYAYSTVO in Russian No 8, Aug 79 signed to press 6 Jul 79 pp 62-65

[Article by D. Kartvelishvili, deputy chairman of the Georgian Council of Ministers and Chairman of the Georgian Gosplan: "A 'Green Light' for Progressive Types of Transport"\*)]

[Text] One of the most important areas for improving the efficiency of social production is the ubiquitous introduction of new types of transport.

The solving of this problem will help to improve transport services for all national economic sectors and to a definite degree to slow down the growth of transport costs, since the profitability of continuous types of transport is higher than the profitability of its traditional types.

One of the most economic types of transport in our nation, as is known, is rail. However, its high capital intensiveness impedes the development of new railroad lines. Suffice it to say that over the entire postwar period, the railroad network in Georgia has increased by only 5.7 percent. It must be pointed out that under the conditions of our republic, the construction of highways also costs comparatively much. Here one feels the problems of the terrain and the high number of man-made structures on the roads.

Under the existing conditions, along with the development of the traditional types of transport, there has also been the spread of fundamentally new and more progressive methods of transporting the ever increasing shipping volumes.

One of the valuable initiatives in this area can be considered the world's first pipeline capsule pneumatic transport, the Lilo-1, built in 1971 for

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\*Articles devoted to the problems of developing new types of transportation are also published in the eighth issues of the journals KHOZYAYSTVO I PRAVO, MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE and SOTSIALISTICHESKIY TRUD.

transporting inert materials through pipes 1,020 mm in diameter over a distance of 2.2 km from a riverside quarry to a reinforced concrete products yard.

In this transport system, the transport device is a cylindrical metal container, and the moving force is the compressed air provided by a compressor.

The new transport has the following indicators: Proportional capital investments per ton of transported cargo 12.9 rubles, annual economic effect of 2.2 million rubles, and a repayment time of 2.5 years. The transporting cost is 2.7 kopecks per ton-kilometer, that is, one-half the amount than by motor transport.

On the basis of the operating experience of Lilo-1, plans were worked out for a new, more advanced modification of the pneumatic container pipeline transport, the Lilo-2. The length of the route is more than 40 km, the pipeline diameter is 1,220 mm, the pressure in the pipeline is 1.6 atmospheres, and the speed is up to 45 km per hour. The transport is designed for transporting large bulks of crushed rock and sand from two large plants to the building industry enterprises of Tbilisi.

The distinguishing features of the new type of transport are the complete automation of the transporting and loading and unloading processes, the absence of a negative effect on the environment, and economy.

The operation of Lilo-2 should show the reliability of the system under the conditions of intense operation, the degree of reducing labor and energy expenditures, and the real reduction in shipping costs.

At present there are plans to work out the designs for building the following pneumatic container pipeline transport systems: in Leninskiy Rayon of Tbilisi for delivering household wastes to the Gldanskiy garbage processing plant (line length 8 km); in Batumi for delivering building materials from the quarry on the Chorokhi River over a distance of 10 km; in the region of Borzhomi for delivering glass packaging from Zurami to the bottling plant over a distance of 34 km, and so forth.

The Chiatura Ore Mining Combine, jointly with the Scientific Research Institute for Mining Mechanics of the Georgian Academy of Sciences and the Tbilisi Polytechnical Institute, intends to work out the plans for a pneumatic transport for transporting ore to the central finishing mill with a productivity of 1.2 million tons a year.

Pneumatic container transport is to be introduced also in other Union republics. Gruzgiprovodkhoz [Georgian Design Institute for Water Management] has prepared the design and estimate specifications for building a pneumatic container transport for transporting building materials in Azerbaijan and Uzbekistan.



More than 50 percent of the republic territory lies at a level of 1,000 and more meters above sea level, and this necessitates the development of suspended cableway transport in Georgia.

Cableways have long been built in the republic for various purposes. The first industrial overhead cableway (OCW) with a capacity of up to 10 tons was built in our nation in Chiatura for transporting significant amounts of ore from the mines to the processing mills and the loading hoppers. Subsequently cableways were built in Tkvarcheli and Tkibuli for transporting coal, and in Kaspi for delivering limestone to the cement plant and at other points. In 1959, an overhead cableway was built in Tbilisi. In addition to it, two other passenger overhead cableways are in operation in the city. As a total in 1978 these cableways transported 1,391,000 passengers. Similar cableways have also been built in Abastumani, Borzhomi, Bakuriani, and elsewhere.

However the development of overhead cable transport is impeded by the lack of modern designs for the overhead cableways which would correspond to the operational and production facilities and the automated control systems for them.

In Georgia, a specialized administration for the development of overhead cableways has been organized, and this is called Gruzkanatdor. It has been entrusted with the long-range and current planning of construction for overhead cableways, the elaboration of measures for their wider use in the national economic sectors, for serving the public and tourists in the industrial and resort zones of the republic, as well as coordinating the actions of all the ministries and departments involved in the development of overhead cableway transport.

The Gruzkanatdor Administration has paid particular attention to developing overhead cableway transport in agriculture. For this purpose the inaccessible mountain hayfields and pastures have been surveyed, as they represent a major reserve for creating a solid feed supply for livestock raising. It has been established that by broadening the feed supply it would be possible to provide green feed for around 20 livestock complexes and 40 farms designed for 30,000 head of cattle.

On the basis of the scientific research carried out by a group of specialists from Gruzkanatdor, experimental models of light-type new freight OCW, the Rikoti-1 and Rikoti-2, have been developed, and these were used for transporting agricultural freight.

During the current year freight OCW will be put into operation up to the mountain hayfields in the village of Sokhta and the TsRU [?central rayon headquarters] of Dzhevskiy Rayon, and a freight and passenger OCW connecting the tea plantation with the tea receiving point in the village of Atsana of Lanchkhutskiy Rayon.

At present Georgia operates 70 overhead cableways, including 30 passenger and 40 freight. In 1978, the designated type of transport carried 8 million persons and more than 10 million tons of freight.

Over the long run Georgia intends to build 168 overhead cableways, 259 km long, including 77 cableways for agriculture with a length of 129 km. The designated OCW will free the republic of the need to build 1,200 km of roads. The total economic effectiveness of them in the national economy will be 80 million rubles.

In November 1978, the Gruzkanatdor Administration under the Georgian Council of Ministers was transformed into Gruzglavkanatdor [Georgian Main Scientific and Production Administration for Cableways]. This is to carry out the functions of the head organization in conducting the range of scientific research, experimental design and planning work, as well as construction, installation and adjustment of special types of overhead cableway transport for the mountainous regions of the nation. It has been given the following tasks: carrying out the functions of the sole client for the designing and construction of overhead cableways for Georgia, regardless of their departmental affiliation, the organizing of the corresponding subdivisions which would provide for the comprehensive execution of the complete cycle of scientific research, experimental design, planning, installation, repair, construction and adjustment work.

In 1980, in accord with the plan for the development of science and technology, Gruzglavkanatdor is to introduce an experimental model of an automated control system for the drive of the overhead cableway, to develop the experimental model of a freight overhead cableway of the gravity type for carrying hay, to create an automated data retrieval system for the processes of transporting tea leaf on the plantations, and so forth.

The extensive program of building overhead cableways and other types of progressive transport cannot be carried out without setting up the appropriate machine building base. Unfortunately, the construction of a plant to manufacture the equipment and cars for the overhead cableways has been greatly drawn out, and this can tell negatively upon carrying out the intended plans to put up the overhead cableways.

The involved organizations and the councils of ministers of the Union republics have been instructed to prepare measures for extensively introducing pipeline, pneumatic container, hydraulic, overhead cableway transport as well as systems of conveyor trains for transporting loose freight into the national economy in 1981-1990.

Conveyor trains which embody the advantages of conveyor and rail transport are small cars which move continuously at set intervals along a rail track. A conveyor train provides an opportunity to transport large amounts of freight over track with significant grades and small-radius curves. Preliminary calculations have shown that the cost of transporting freight by such a method is significantly lower than by rail and motor transport.

In the republic, the questions of designing and introducing the conveyor trains are the concern of the Tbilisi Department of the VNIIPitransprogress [?All-Union Scientific Research and Design Institute for Progress in Transportation], jointly with Gruzgiprovodkhoz. It has been proposed that this type of transport be used in water management projects.

The introduction of a conveyor train is divided into two stages. The first is the experimental transport system with a linear turbine engine designed for transporting river dredgings to the crushing mill in the village of Shuvaleri. The initial productivity of the system will be 5 million tons of dirt a year. With this same system conditions and equipment will be developed for increasing its productivity up to 50 million tons a year.

After practical testing designing will move on to the second stage, when development is started on an industrial system to create the Dalis--Mta Dam on the Iori River. The body of the dam, according to the plans, should contain around 12 million tons of crushed rock, sand and loams.

In using traditional methods, such earthmoving would draw out the construction of the dam to 8-10 years. Using the conveyor trains, this work can be done 5-fold more rapidly.

As a rule, hydraulic reclamation work entails the movement of significant masses of dirt. For this reason, the republic scientific and design organizations consider the use of conveyor trains as promising for hydraulic dredging of the Kolkhid swamps, protecting the shores of the Black Sea, and so forth.

We must also point out one other type of new transport which has no analogue in the world, the container transport in existing gas and oil pipelines. Due to the special design of the capsule containers and in using the energy of the flow, this transport can carry large amounts of freight in any direction, including against the flow.

At present, the scientific and technical problems of new types of transport in Georgia are the concern of Gruzgiprovodkhoz, the Tbilisi Department of the VNIIPitransprogress, the Scientific Research Institute for Mining Mechanics of the Georgian Academy of Sciences, the Georgian Polytechnical Institute imeni V. I. Lenin, the Scientific Research Institute for the Food Industry and the special Pnevmotransstroy [Pneumatic Transport Construction] Construction and Installation Administration.

In our opinion, such a structure leads to the scattering of the scientific and technical forces and creates parallelism in work.

The necessity has arisen of reviewing the question of concentrating the forces and equipment of the scientific-technical and other organizations which exist in Georgia. This will provide an opportunity to rally the scientific and technical forces and accelerate the carrying out of the tasks existing in the transport area.

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## TRANSPORTATION

### GREATER USE OF PNEUMATIC TUBE TRANSPORT ADVOCATED

Moscow PLANOVYE KHCZYAYSTVO in Russian No 8, Aug 79 signed to press 6 Jul 79 pp 65-71

[Article by A. Aleksandrov, chief of the Special Design Bureau for Progress in Transportation, and Yu. Tsimbler, chief engineer of the bureau: "A New Type of Transport in the Service of the National Economy"]

[Text] The materials of the 25th CPSU Congress stipulate: "To carry out the further development of industrial transport. To more widely introduce continuous types of transport such as conveyor, pipeline, including pneumatic container and overhead cableway."<sup>1</sup>

The efficiency of social production, and the further growth of the production of industrial and agricultural product over the long run are linked to the rational solution to complicated transport problems on a nationwide scale by the technical reequipping and expansion of the existing types of transport and the development of new ones capable of carrying people and freight under different geographic and climatic conditions.

The widely used methods of improving and expanding the existing types of passenger and freight transport, particularly over short or medium distances, into areas with large population and industrial centers and into inaccessible areas have turned out to be unusable or ineffective. Thus, even the presently existing types of transport do not always provide prompt and uninterrupted delivery of freight to large urban centers from adjacent areas or within these centers; they do not always transport building materials as well as ores, coal and other minerals from the quarries or ports to the plants and processing mills. The highways and railroads in a number of regions are so overloaded that a further intensification of them is difficult.

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<sup>1</sup>"Materialy XXV S"yezda KPSS" [Materials of the 25th CPSU Congress], Moscow, Politizdat, 1977, p 207.

In addition, the operation of transport systems in the designated spheres costs rather a lot, it entails noise and polluting of the environment, interference for other types of transport, and necessitates the involvement of significant labor resources for maintaining it. Under certain complicated local conditions (the Far North of the USSR, swamps, mountains and so forth), the transporting of significant quantities of various freight is difficult and expensive, and it cannot be carried out by the widely used types of industrial transport.

The carrying of large amounts of loose freight from quarries to the points of its processing and use over a distance of up to several score kilometers is presently carried out by motor transport. This requires the labor of many thousands of people engaged in operating the transport and carrying out monotonous work which could be easily be replaced by more productive automated transport systems. At the same time, the operation of motor transport in such shipping entails the expenditure of oil fuel, a valuable raw material for the chemical industry, and is accompanied by noise and the polluting of the air basin with exhaust fumes.

The transporting of loose freight by motor and rail transport also entails significant losses along the route.

The removal of the ever increasing amounts of household wastes to the areas of their disposal or reutilization represents a particular transport problem for the large modern cities (each year around 7 million m<sup>3</sup> of garbage is transported out of Moscow). The existing methods of transporting household wastes involve large expenditures of manual labor, the use of motor transport, and they do not meet the high sanitary and hygienic requirements of the life of the population and the protection of the environment.

The idea which has arisen in recent years of transporting various freight through pipelines in special containers has attracted the attention of specialists from the most diverse areas of the national economy in our country and abroad. The scientific centers of a number of nations are at work solving the theoretical and technical problems of using pipeline transport for moving loose and crated-piece freight. This type of transport has been most widely used in postal shipments (FRG and France). The United States is developing the plans for pneumatic transport to move passengers. Research on the use of pipeline container pneumatic transport (CPT) for moving industrial freight is being carried out in the United States and Great Britain.

Since 1968, the USSR has been working on the development and introduction of CPT systems into the national economy for moving industrial and agricultural freight. The research and development carried out made it possible in 1971 to put into operation the first major system for pipeline container pneumatic transport, Lilo-1, with a diameter of 1,020 mm for delivering crushed rock from the quarry to the reinforced concrete products plant; this system was built in the settlement of Shulaveri, not far from Tbilisi, using the plans of a group of specialists from the Transprogress SKB [Special Design Bureau

for Progress in Transport] of the RSFSR Glavneftesnab [Main Administration for the Transport and Supply of Oil and Oil Products] and Grugiprovoikhoz [Georgian Design Institute for Water Management] of the Georgian Ministry of Reclamation and Water Resources.<sup>2</sup>

On the basis of the technical plans tested out in the Lilo-1 system and the elaborated methods for calculating the CPT systems using a computer and the experimental design and experimental work carried out, CPT systems have been designed (Table 1) for transporting inert building materials (sand and crushed rock) in the areas of Volgograd and Tbilisi (Lilo-2), and Tul'skaya Oblast, as well as for transporting household wastes out of Leningrad.<sup>3</sup> In 1979, there are plans to complete CPT systems in Tul'skaya Oblast, as well as the first stage of Lilo-2 18 km long in Georgia. The construction of an analogous system in Leningrad should be completed in 1980. In 1973-1974, a series of decisions were taken to introduce CPT systems in the national economy. In this regard, the Transprogress SKB has been entrusted with the functions of working out the systems of industrial pipeline container pneumatic transport for the quarry and municipal systems (the transporting of building materials, minerals and household wastes) as well as for internal plant shipments.

The Tenth Five-Year Plan outlines a specific program for introducing new transport into the national economy. In accord with this program, provision has been made for the designing and construction of a series of CPT systems for the enterprises of the coal industry, the building industry and municipal system, as well as for experimental units and stands.

In 1978, at sessions of the board of the USSR Gosplan, the Presidium of the RSFSR Council of Ministers and the traveling planning commission of the RSFSR Gosplan, in Orekhovo-Zuyevo, the question was examined of developing work to create and introduce CPT systems into the national economy, and full decisions were approved to accelerate this work. In carrying out the approved decisions, the Transprogress SKB has completed the construction of an experimental CPT system at its base (a diameter of 1,200 mm and 4 km long) which is the prototype for a large industrial system, as well as a series of testing stands for developing standard designs of special equipment and testing the theoretical developments. Using this system, in 1980, development will be completed on CPT systems for transporting up to 5 million tons of loose materials per year over a distance of up to several score kilometers.

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<sup>2</sup>For more detail see: A. M. Aleksandrov, V. Ye. Aglitskiy, P. V. Kovanov, I. D. Suladze, and Yu. A. Tsimbler, "A New Profession for a Pipeline," *PROMYSHLENNYY TRANSPORT*, No 3, 1972, pp 11-15.

<sup>3</sup>For more detail see: P. V. Kovanov, A. M. Aleksandrov, Yu. A. Tsimbler, V. Ye. Aglitskiy, G. M. Alekseyev, and S. I. Mishin, "Household Wastes are Transported by Pipeline," *PROMYSHLENNYY TRANSPORT*, No 9, 1976, pp 15-16.

Project name	a	b	c	d	e	f	g	h	i	j	k
1) Карьер-завод стройиндустрии в Волгограде . . . . .	6 Песок	3.0	13	1500	9 Два- труб ная	9.2	5.7	2.5	383	0.85	2.2 fold
2) Карьеры в пос. Шулаверы и Имири-заводы стройиндустрии в Тбилиси, Марнеули (Lilo-2)	7 Щебень	2.0	43	1200	9 Два- труб ная	35.0	2.5	2.6	3111	0.67	12.1 fold
3) Юго-Западный район Ленинграда--завод механизированной переработки бытовых отходов . . . . .	8 Бытовые отходы	0.12	12	1500	9 Два- труб ная	7.2	7	15.7	145	1.3	1.7 fold
4) Карьер Берники--асфальтобетонный завод (Tul'skaya Oblast)	7 Щебень	0.3	2.4	1200	10 Одно- труб ная	1.9			experimental system		
5) Карьер-завод железобетонных изделий пос Шулаверы (Lilo-1)	7 Щебень	0.6	2.0	1200	11 Одно- труб ная с разъ- ездом	0.5			experimental system		

Key: a--transported material; b--annual transport volume, million tons; c--distance of transporting, km; d--pipe-line diameter, mm; e--type of system; f--estimated construction cost, million rubles; g--repayment time, years; h--cost of pneumatic transport, kopecks per ton; i--annual economic effect, thousand rubles; j--energy expenditures, kilowatt hour per ton-kilometer; k--increase in labor productivity; 1)--Quarry-building industry plants in Volgograd; 2)--Quarries in the settlements of Shulaveri and Imiri to the building industry plants in Tbilisi and Marneuli (Lilo-2); 3)--The southwestern rayon of Leningrad to the mechanized garbage processing plant; 4)--The Berniki quarry--the asphalt concrete plant (Tul'skaya Oblast); 5)--Quarry--reinforced concrete products plant in the village of Shulaveri (Lilo-1); 6--sand; 7--crushed rock; 8--household wastes; 9--double pipe; 10--single pipe; 11--single pipe with bypass.

The Transprogress SKB is also working on the creation of systems for internal plant container pneumatic transport, for example, for the Saransk Machine Plant.

In 1973, the CPT systems developed by the Transprogress SKB were awarded the Transprogress trademark and a license was sold to Japan for these systems.

The lead of the USSR in the development of a system for pipeline container pneumatic transport has been reinforced by many score certificates of invention in the USSR and patents in England, Italy, India, Canada, the United States, France, FRG, Sweden and Japan.

Generally speaking a system of industrial CPT represents transport pipelines in which containers on wheels formed into trains or individually move in a flow of air created by air blowing stations. In moving loose freight in a quantity of over 1 million tons a year over a distance of more than 10 km, all the loading, unloading and transport operations are fully automated. Such automated systems (CPTa) as a rule are double-line with loaded containers or trains moving through one pipeline, and empty containers or with other freight moving through the other one in the opposite direction. In transporting a comparatively small amount of loose freight (up to 1 million tons a year) over a distance of up to 10 km, the loading and unloading operations are mechanized, and the control system is simplified. Such mechanized systems (CPTm) are usually single-line.

The transport pipelines for moving large amounts of loose freight, household wastes and packaged freight are made from large-diameter steel pipe with a longitudinal seam. Since the effective pressure in the pipeline is low, it is possible to use pipe made from the cheapest low-carbon steels. In the future it has been proposed that reinforced concrete, asbestos cement, plastic and other pipe be used as a transport pipeline.

With the involvement of specialized organizations, work is being carried out to create low pressure reinforced concrete pipe for the CPT systems, and the experimental models of this pipe are being tested. Next year, at the scientific experimental and experimental-production base of the Transprogress SKB, an experimental section will be built from reinforced concrete pipe on the existing experimental CPT system. This pipe can replace scarce steel pipe on the straight sections.

Glass, plastic, fiberglass and sheet metal pipe, including spiral-seamed, can be used in internal plant transport systems for moving small light freight.

The diameter of the pipe used in the system depends upon its calculated capacity and the overall dimensions of the freight to be transported. In the CPT systems, turboblowers, centrifugal blowers, compressors and vacuum pumps are used as air sources, and fans in the internal plant systems. The air blower stations equipped with air sources for moving containers are



assembled both on the end legs of the pipeline (the head stations) as well as along the transport pipeline at the calculated points (intermediate stations).

Loading and unloading stations are provided in the CPT systems. All the operations of loading and unloading the containers as well as the controlling of their movement in the CPTa systems are carried out and monitored from a central control board.

The CPT systems can be both stationary as well as movable (prefab). The latter can be quickly moved from point to point and be employed, for example, at large construction sites for supplying various building materials (sand, crushed rock, limestone, cement and so forth).

CPT systems have a number of essential merits which distinguish them from the other well-known means of transport. These include: rapid cargo turnover, and they provide steady delivery of the freight in any weather and climatic conditions with an air temperature from  $-30$  to  $+40^{\circ}$  C. Due to the possibility of laying pipelines in mountain conditions, on swampy terrain or in inaccessible areas, the CPT systems can be employed where the use of other types of transport involves very great technical difficulties and material outlays.

All the loading, unloading and transport operations are easily automated, and this makes it possible to minimize the number of service personnel, and to provide high labor productivity, approximately 10-fold higher than in motor transport. Such advantages argue in favor of introducing the CPT systems in remote areas with limited labor resources.

The cost of transporting freight using the CPT systems is 2-3-fold lower than by motor transport. The wheels on the containers of the Transprogress systems are covered with a layer of rubber, and for this reason the wear of the transport pipeline is almost completely absent. The same feature of the transport equipment makes it noiseless, and because of this the Transprogress systems can be widely used in urban conditions for transporting various freight (building materials, raw products, finished products, agricultural products, mail and household wastes) and in the future for moving passengers.

Due to the fact that in the CPT systems the freight to be moved is isolated from the surrounding medium, losses of the freight en route are excluded, and when necessary special sanitary and hygienic conditions can be maintained (for example, in issuing feed to livestock complexes, as well as temperature and other special conditions).

A major advantage of the CPT systems is their high reliability and great durability. This is caused by the fact that the air blowers which provide the energy for the means of transport (the containers) operate under stationary conditions with good operating conditions, and there is the opportunity of automatically tripping in a reserve unit. The air current acts as the "unbroken" transmission, and all the wheels of the containers are

driven, and this along with the surfacing of them with rubber or another similar material creates conditions for the trouble-free extended service life of the transport pipeline (up to 40 years with the corresponding protection of it against corrosion).

The technical and economic research carried out by the Transprogress SKB on the CPT systems and their comparison with other types of industrial transport have shown that the pipeline container pneumatic transport, like any pipeline transport generally, in possessing comparatively high capital investments, has low operating expenditures, and as a result of this the calculated expenditures (over a very broad range of productivities and distances) are below the calculated expenditures of comparable types of transport. The advisability of employing the CPT systems should be settled in each specific instance by a comparison with the other types of transport, depending upon the freight flow, the nature of the freight, the climatic conditions, terrain, availability of labor resources, and other factors.

For determining the place of employing the new type of transport, comparative technical and economic calculations were carried out for the CPT systems and the motor and rail types of transport in moving inert building materials (sand, crushed rock, gravel and so forth) under the conditions of a flat-hilly terrain. From the results of these calculations (proceeding from the equality of calculated expenditures) the approximate areas of employing the designated types of industrial transport were determined for moving the designated freight. Thus, the most economically effective was the use of the CPTa systems with an annual shipping volume from 1 to 7 million tons of freight over a distance from 10 to 100 km, and the CPTm systems with annual shipping volumes up to 1 million tons of freight per year over a distance up to 10 km.

The state of developing the CPT systems makes it possible to begin to widely introduce the new type of transport, and this will replace a significant number of motor vehicles and will partially free the railroads from the transporting of building materials, coal, ores and agricultural products over short distances.

For settling the question of the possible scale and effectiveness of introducing the industrial CPT systems in the near future, upon the initiative of the USSR Gosplan, comparative calculations were run on the technical and economic indicators of the CPT systems with motor transport in transporting inert building materials under the conditions of the middle zone of the nation.

According to the data of the USSR Ministry of Building Materials Industry, the nation has over 6,000 inert materials quarries from which freight must be transported to consumers. Many such installations are located in the ore-mining and coal industries and under the other construction ministries of the USSR and the Union republics.

If even a small portion of these shipments is turned over to the container pipeline pneumatic transport and CPT systems are introduced in the national economy over the next 10 years for transporting 800 million tons of loose

freight, the work of motor transport will be reduced by approximately 7 billion ton-kilometers per year. Here around 1 billion rubles of capital investments will be saved, more than 40,000 12-ton dump trucks will be freed, as well as 63,000 persons due to the growth of labor productivity, while the annual savings of diesel fuel will be over a million tons.

However, at present the problem of introducing the CPT systems into the national economy has encountered serious difficulties, the main ones being the absence of production capacity for producing the special equipment and the necessary construction facilities (construction, installation and start-up organizations), the lack of resources of individual types of materials and serially produced equipment, in particular such as the TV type air blowers which are produced by the Chirchik Uzbekhimash [Uzbek Chemical Machinery] Plant and the large-diameter pipe (1,000 and 1,200 mm) from low-carbon steel with a longitudinal welded seam and walls 8 and 10 mm thick.

In the CPT systems, for the first time in the history of transport equipment, the questions have been solved of fully automating the transport process itself as well as the loading and unloading processes. The new type of transport, in freeing a large number of people, is characterized by the high complexity of many elements of its equipment. A special industry is required for manufacturing the latter.

We must also mention that individual ministries have not shown proper attention to the questions of developing the CPT systems, and in particular the USSR Ministry of the Building Materials Industry has still not settled the question of building a CPT system which is economically advantageous and very necessary in sanitary terms for the enterprises of the Volgogradstroy-materialy [Volgograd Building Materials] Association (in Volgograd) and which was planned in 1975.

The difficulties of manufacturing the special equipment for the CPT systems are caused mainly by the fact, as was pointed out at the November (1978) Plenum of the CPSU Central Committee, that there has been the unsatisfactory implementation of the program for the accelerated development of the output of materials handling equipment. This program provides for the construction of two plants for producing pneumatic transport equipment within the system of the Ministry of Construction and Road Machinery. For this reason, for extending the introduction of new transport in the RSFSR, over the next few years there are plans to create capacity at the Transprogress SKB for producing the special equipment needed for the CPT systems for the requirements of the republic's enterprises. It is also essential to take measures to expand capacity for producing the required assortment of large-diameter pipe (in a quantity of about 1,000 km per year), as well as for the additional annual output of air blowers (an average of 1,000 per year).

The planned supply of all the necessary material and technical resources for carrying out the work involved in developing and introducing the CPT systems is a decisive condition for the development and introduction of the highly efficient industrial transport into the national economy.

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## TRANSPORTATION

### ROLL-ON, ROLL-OFF CONTAINER SHIPS FOR RIGA LINE

Msocow VODNYI TRANSPORT in Russian 29 Sep 79 p 2

[Article by the editors of the newspaper LATVIYSKIY MORYAK, a collective correspondent of VODNYI TRANSPORT: "Ro-ro Line: A Hitch At the Start"]

[Text] One of the notable innovations of this summer for sailors of Latvia and dockworkers of the Riga port was the opening of regular service on the new Riga--Rostok--Riga ro-ro line. A motorship of the "ro-ro" type, the "Inzhener Nechiporenko," was placed on the route of friendship instead of the "Irbites" motorship, which served this international route for many years.

The very fact of such a replacement, signifying the absolutely obvious interest of Baltic transport workers and their German colleagues in progressive technology, is a gratifying phenomenon. In the parting speech which the crew heard on the day of the line's festive opening, the desire was expressed for the assimilation and creative development of the useful, innovative experience which was accumulated by other ro-ro vessels or Soviet-French and Soviet-British lines and or other runs operationally similar to the trips to Rostok.

About 2 months have passed since the "Inzhener Nechiporenko" began to make regular trips to the fraternal country located on the other side of the Baltic. It is possible and necessary to ask how was this started and what was learned by the analysis of the first weeks of operation. The overall evaluation of the state of affairs on the line both on the part of the KhEGS [not further identified] No. 3 of the Latvian Maritime Shipping Line, and on the part of the partners in the cost-accounting subdivision--the dockworkers of the Riga maritime port, is not too optimistic. As is shown by the analysis of these runs, along with positive results there are also conclusions of a

negative kind, and these last clearly tip the scales. There definitely was a hitch at the start of the new method, by the inadequately clearcut preparation of links in the technological chain for the planned experiment.

As is known, on ships with the horizontal method of loading and unloading the very "core" of high effectiveness is the smooth interaction of the dockworkers and the crew, the accuracy and clarity in fulfillment of envisaged, as a rule, owing to maximum planning of the times for processing the vessel at the docks. The ideal one is the version where the whole batch of freight awaiting shipment by sea is completely ready by the time the ro-ro arrives, and then in secured form, on roll-trailers, or flats and in containers. The process of "rolling" the freight onto the motorship in this version yields to preliminary calculation with an accuracy of up to half an hour or even more strict, for in principle there should be no delays whatever.

If we apply this criterion to the trips of "Inzhener Nechiporenko," the picture turns out to be less glowing and satisfactory than was expected by many. Namely the technological aspect of preparation of the freight in port, the intensiveness of the work of the dockers have become the "vulnerable" link in the new line. The matter was organized more or less satisfactorily only for shipment of equipment, of technical materials, where it was possible to overcome the rough edges, as it is said, on the run, in the process of the work. Still more complex is the business of loading a bulk commodity of the line such as automobile tires onto the ro-ro ship. Here the displeasure with the first results is absolutely mutual: the technology used by the Riga people satisfies neither the dockers themselves nor the cost-accounting group, nor the crew of the ship.

Well, no wonder! It was envisaged to put the automobile tires on the roll-trailers on the territory of the Second Operations Region of the port, and then to move them to the First Region, since that is where the ro-ro dock is located. This is very inconvenient and complicated now, but it will be still more complicated during the freakish Baltic winter. It is not possible to consider as successful in any way the technological version of loading and transferring the ill-fated tires used in the first trips. The tires are placed in several rows on the roll-trailers, and most often this labor proves to be unproductive, complex, and a great deal of time is spent in preparation for loading and for fastening operations. But the most substantial shortcomings is something else: Since the tires coming for shipment are of very different diameters (the dockers have counted up to 20 type sizes!), in a number of cases it is not possible in any way for them to fill the roll-trailers compactly. Sometimes the tires have to be put at a height of three meters and then it is necessary to undo all the gaps, because one layer "plays," is flattened out under another. It is possible for a combined brigade to place from 7 to 9 tons of this "troublesome" freight on a 40-ton trailer.

We will note in passing that the problems of labor safety of the dock workers, and simultaneously the safety of shipping the freight by sea also are not solved so easily. The bulk of the time is taken by installation of the separations--all kinds of posts, slabs, pads and bracings.

If we sum up all that has been said, even the most cautious conclusion will, perhaps, be this: the hauling of tires on wheeled trailers seems to be inefficient, and the huge labor outlays are not justified. Any innovation is good only when it expresses a qualitatively progressive step, insures the best productivity of labor, more effective use of manpower, or a saving of time. Here in comparison with earlier tested technology a step has been taken backward rather than forward. On the "Irbitles" tires were loaded and shipped more economically; there were no problems with them.

Who should be made accountable for this "hole" in the organization of shipments? The cost-accounting group is inclined to consider that it is the dockers, and only them. But they reasonable remark that discussed in the mutually approved documents regulating the obligations of the parties is cooperation and mutual assistance, the joint search for the best version, and, they say, there has been none of this! Practice should have shown what was obtained from what was planned, what yielded the expected result, and what did not justify itself. Since the present version of hauling automobile tires on roll-trailers has proven to be ineffective, many are inclined to transporting these batches of freight not on ro-ro's but on tramp vessels.

Something similar happend regarding the hauling of cable on the "Inzhener Nechiporenko." As long as there are reels of small dimensions there are no problems. Small-diameter cable products are successfully placed on the roll-trailers, and the capacity of these "trucks" is let us say the 11-ton ones. In general only one such "heavyweight" is placed on a roll-trailer! And the trouble does not stop here: since the weight in this coil is solid and the shape is round, the whole load is concentrated in the middle of the roll-trainer. It, naturally, is bent, misshapen, and often after such a trip it requires repair.

How does it turn out in the end? The roll-trailers , which for the dockers are worth their weight in gold, are used wastefully and are broken. The possibilities for placing them on board the vessel are also limited. And in general the question is a legitimate one: "Is the game worth the candle?"

In fairness it is necessary to recall that in the preparatory period, when all the details of the future joint work on the line were discussed, there was talk of four different versions of transporting cable. It was supposed that the criterion of truth would be practical experience, that is, that in the process of developing the line the crew and the dockers would determine how best to transport coils of different sizes--some on roll-trailers, others in flats loaded on roll-trailers, and still others simply in flats. It was hardly ruled out that some part of the cable would be transported by individual locations. At one of the meetings of the interested parties, which was

attended, by the way, by the chief dispatcher of the port of Rostok, it was written in the document coordinated by all the participants: "Large-size cable with a diameter of over two meters will be transported by individual locations."

Unfortunately, this agreement was subsequently forgotten, and the dock workers of the First Region established more than one case when the KhEGS urgently recommended that they place one large roll of cable on a 12-meter roll-trailer. Is it possible after this to be surprised that there are constantly not enough maneuverable "trucks" for the dockers?

Annoying gaps in preparation of the port for service by a "ro-ro" of a regular line were detected also during the shipment of cardboard to Rostok. There are not enough fastening materials which would reliably guarantee the reloading and transporting of this "delicate" freight. The Riga people fasten the rolls with chains and wooden angles instead of metal ones, and this method, as has been shown by practice, is hardly the best of those possible. According to comments made by the German partners, some of the rolls arrive damaged at the warehouses of the customers. This is a serious signal which must be taken.

All the rough edges of the new line, the large and small ones, should be resolved by the joint efforts of the cost-accounting group, the services of the shipping line and the collective of dockworkers. The search for effective solutions is possible only on the tested route of cooperation, mutual assistance and initiative.

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## TRANSPORTATION

### SHORTCOMINGS IN THE VIL'NYUS DIVISION OF THE BALTIC RAILROAD DISCUSSED

Vil'nyus SOVETSKAYA LITVA in Russian 19 Aug 79 p 2

[Article by A. Grokhotov, inspector of the People's Control Committee of the Lithuanian SSR: "We Must Make Stricter Demands on Ourselves"]

[Text] The problem of meeting the demand of the national economy for rail freight transport has of late become especially acute. Railcars and containers are in short supply and the transport plans are being frustrated.

Why are the railroad workers not fulfilling their obligations? What is holding them back--are there really no freight cars or are they merely poorly utilized? Is the technical equipment of the stations and sectors possibly inadequate? Or is it the clientele that is at fault?

However, judging from the data reported, all these questions seem inappropriate. The fact is that according to the reports of the Vil'nyus railroad division the freight transport plan--computed in tons--was fulfilled for the first 6 months of this year; and as regards freight shipments computed in terms of railcars, the plan was even overfulfilled. In short, everything appeared to be normal.

However, this is not the case. In fact, the Vil'nyus railroad division fulfilled only to 84 percent the transport volume plan for the enterprises and organizations of the republic. This discrepancy between the actual situation and the data reported resulted from serious shortcomings in the planning and calculation of the transport volume. Not included in the plan are various--large-volume--shipments that are clearly intended to be dispatched. For example, year after year large volumes of raw and building materials are shipped across the borders of the republic; although these shipments are usually not included in the plan--or only in small quantities--they are listed in full in the fulfillment reports. This is what accounts for the seemingly satisfactory picture in regard to the fulfillment of the transport plans by the railroad workers. Likewise entirely unfounded are the division's official reports to the effect that even though the freight shipment plans are not being fulfilled it is in most cases the enterprises themselves that are to be blamed.



The principal cause underlying this extremely bad situation is the unsatisfactory utilization of the existing railcar fleet. There is an indicator--the railcar turnaround time--that determines the degree of the fleet's utilization. In the Vil'nyus division, this indicator has been falling off year after year. This year, the railcar turnaround time has been reduced by nearly one-fifth as compared with 1974. As regards the fact that just in the first 6 months of this year the targets set in regard to railcar turnaround time were not met, unproductive layovers accounted for nearly 4 million car-hours, which is equivalent to the loss of 26,000 railcars (based on the railcar turnaround times for the entire network). Thus it is clear that if the railroad division met the target set for railcar turnaround time, there really would be no problems in regard to the maintenance of freight transport.

What accounts for these excessive unproductive railcar layovers? Approximately one-third of these layovers resulted from the nonobservance of time norms in the processing of transit cars; to a certain extent, this is due to the fact that the technical development of the stations, sectors and other subdivisions lags behind the increasing freight turnover. However, the principal cause are the serious shortcomings in operational organization, as a result of which thousands of trains and engines have been standing idle at the station approaches, with hundreds of trains being kept at line stations on account of their nonacceptance by junctions such as Vil'nyus and Paneryay.

An especially unsatisfactory situation arose in the division in connection with the processing of "local" railcars coming into the station for loading or unloading. As regards these cars, there were over 2.5 million car-hours of above-norm layovers in the first 6 months of this year. Responsible for these layovers were not only the railroad workers, but also the clientele. However, it is worth examining thoroughly who "contributed"--and to what extent--to this state of affairs. For example, at the Vil'nyus station (director: Comrade Karpavichyus), in the first 6 months the above-norm layovers of railcars coming in for loading and unloading totaled 833,000 car-hours. However, no more than 1 percent of these layovers can be blamed on the enterprises and organizations of the city.

Then what is the matter? Here there make themselves felt both the shortcomings in the organization of switching operations at the Vil'nyus station--as a result of which the incoming cars stand idle for long periods, waiting for loading and unloading service--and especially the shortcomings in the freight yard where the railroad workers carry out the loading and unloading. Responsible for the work of these sectors are the comrades Tsitsarev and Gerulaytis. At the freight yard, the warehousing services are quite insufficient and its technical equipment is inadequate; moreover, the unloading operations are in the main carried out in one shift. As a result of all these shortcomings, invariably hundreds of railcars--bound for the freight yard--stand idle at the station for 48 to 72 hours, waiting to be unloaded. These cars occupy the classification tracks and restrict the anyway extremely inadequate switching capacity of the station, which leads to disruption in the reception of incoming trains.

in the Vil'nyus division, a total of 121,000 car-hours of above-norm layovers were caused by enterprises equipped with spur tracks. However much the railroad workers may try to draw attention to and exacerbate this problem, the clients account for no more than 4 percent of all above-norm layovers. And the layovers often result from the freight recipient's lack of information concerning the approach and delivery of the railcars.

The failure to provide such information leads not only to above-norm railcar layovers, but also to great losses of financial and labor resources. Thus, in the Vil'nyus Grain Products Combine the lack of reliable information and the irregular delivery of the cars to the spur tracks resulted in 1978 in layovers and losses of over 19,000 man-hours, which is equivalent to 10 workers idling for almost a whole year. And one could adduce many examples of this kind. Clearly, if the railroad workers really want to reduce the railcar layovers in the customers' loading operations, it will be necessary to provide the customers with reliable information concerning the approach of shipments and the delivery of empties--a system which is already being employed by our neighbor, the Belorussian Railroad: Here the clients are given 48-hour-advance notice of the delivery of railcars. This is especially important before holidays and days off.

Extensive unproductive layovers of cars coming in for unloading are also caused by their piling up at the stations of the division and by their presentation for unloading in excessively large batches. However, the principal reason underlying this unsatisfactory situation in regard to railcar utilization are the extremely serious shortcomings and the low level of organization of the operational and loading work in the division. This is evidenced specifically by the results of a test--conducted by the Committee of People's Control of the Lithuanian SSR--of the utilization of the cars coming into Gayzhyunay Station and bound for the Ionava "Azot" Production Association.

In presenting the cars for unloading and loading, the railroad workers generally showed a flagrant disregard for the schedule. This resulted in unproductive layovers at the station and disrupted the work rhythm at the spur tracks. On account of the irresponsible attitude of the division staff and of the traffic division (director: Comrade Klere) in particular, for several days no cars--or only very few--were delivered for loading and unloading. But on other days, so many cars--loaded ones and especially empties--arrived at the spur tracks that even with the best will of the world it proved impossible to process them according to schedule. Apart from the demurrage, this resulted in extensive idling of the work force and of the loading and unloading equipment.

In violation of current regulations, the division presents for loading a great many soiled cars still containing sweepings. Meeting the railroad workers halfway in consideration of their difficulties, the "Azot" Association agreed to accept such cars; in the first quarter, the Association's own workers cleaned and prepared for loading over 2,000 soiled cars. As a token of "gratitude,"

the railroad workers considered the time the Association spent on this work to be above-norm demurrage and charged and exacted from the Association a fine.

In the first quarter of this year, nearly 1,500 cars were fed to the spur tracks of the "Azot" Association; these cars were for the most part defective and unfit for loading mineral fertilizer. Naturally, all of these cars were rejected and--marked as "defective"--sent back on the line. In point of fact, these cars were excluded from one turnaround, which accounts for nearly 72 hours of loading operations in the division. At the Gayzhyunay station alone, the unproductive layovers of these railcars totaled approximately 40,000 car-hours. The test which was carried out with the aid of computers established altogether unprecedented facts: Sometimes the rejected cars dispatched from Gayzhyunay Station were repeatedly--sometimes even three to four times--sent back, presented for loading and again rejected. In accordance with instructions by the workers of the traffic division, many of these rejected cars were sent to other enterprises where they were again rejected and dispatched as empties.

The test also disclosed extreme neglect of the accounting and reporting work in the division. The results of the test testify to the fact that the data of the Vil'nyus railroad division concerning the above-norm car layovers on the spur tracks of the "Azot" Production Association do not at all correspond to the actual state of affairs.

The republic's Committee of People's Control examined the results of the study and called to account a number of officials, including A. Klere, deputy director of the railroad division and director of the traffic division, and I. Terebeyzu, the Gayzhyunay station master.

The marked deterioration of the operational work, the inadequate technical development of the stations, and the serious lag in the development of the railcar service and of the loading service in particular have led to serious difficulties in the work of the division and to considerable deterioration in regard to the utilization of the railcar park. So why are the railroad workers of the Vil'nyus division not calling out at the top of their voices about their difficulties, why are they not persistent in solving the important problems in connection with the technical development and equipment of their industry, why are they instead trying to sidestep these sharp corners and to hush up and conceal their shortcomings in every possible way, blaming the situation on the clients?

It was not by accident that there developed a situation in which the leading control organs directed their attention mainly toward improving the division's industrial rail transport to which they allocated considerably more capital investments than to the development of road transport.

In our opinion it is crucially important for the Vil'nyus division to develop the loading services and above all the Vil'nyus and Kaunas junctions where there has been for a long time an urgent need for reorganization and

construction of mechanized warehouses, for continuous, around-the-clock shift work in the unloading operations, and for reduction of the surplus in cars to the technological norm.

It is time for the railroad workers uncompromisingly to enforce high-quality standards in the unloading operations, categorically to prohibit the dispatch of soiled or defective cars from the unloading stations and to take comprehensive measures toward speeding up the delivery of railcars for loading and unloading and their removal upon the termination of the loading and unloading operations.

The Baltic Railroad and the Vil'nyus division must speedily introduce a telegraphic information system by which the clients can be given reliable advance notice of the arrival and presentation of railcars for loading and unloading. The work of the division management must focus on the implementation of measures aimed at furthering the development, mechanization and automation of the stations and sectors--measures that have been approved by the decree--entitled "On Measures Aimed at Developing and Improving the Work of Rail Transport During the Period from 1976 to 1980"--which was passed by the Central Committee of the Communist Party of Lithuania and the Council of Ministers of the Lithuanian SSR.

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## TRANSPORTATION

### MOVEMENT OF TRAINS FOR THE MONTH OF SEPTEMBER

Moscow GUDOK in Russian 13 Oct 79 p 2

[Article: "Schedule of Movement of Trains"]

[Text] For the network as a whole, 97.5 percent of long-distance and local trains and 99.3 percent of the suburban passenger trains departed according to schedule in September. During this same period, 92.3 percent of long-distance and local and 98.1 percent of suburban trains ran according to schedule and with a reduction in the extent to which they were overdue. The passenger schedule on the Transbaykal, October and Baltic railroads was fulfilled at a level of almost 100 percent, while it was fulfilled at a level of 98 percent and higher on the Belorussian, Moldavian, BAM [Baykal-Amur Mainline] and Alma-Ata railroads.

In comparison with the corresponding period last year, the level of running of passenger trains on schedule was improved on the L'vov, Donetsk, Kuybyshev and particularly on the North Caucasus railroads. At the same time, the passage of passenger trains on the Kemerovo, West Siberian and South Urals railroads was poorly organized. On these railroads, 3,830 long-distance and local passenger trains were late during the course of the journey.

Only 85.2 percent of the long-distance and local passenger trains arrived on schedule at their terminal-point stations, which is 5.7 percent lower than the results for September of the past year.

The collectives of the West Kazakhstan and Azerbaijan railroads failed to provide for traffic safety for passenger trains.

The schedule for movement of freight trains for the network as a whole was fulfilled by 76.6 percent. More than 90 percent of the freight trains ran on schedule on the Moldavian, Dnepr, Belorussian and Baltic railroads. The assigned norm for section speed was fulfilled on the Baltic, Donetsk and Belorussian railroads.

A considerable surplus of the operating fleet was to be found on the Transbaykal, Far Eastern and some other railroads of the Urals and Siberia. The



running of freight trains according to schedule deteriorated chiefly owing to shortcomings in the maintenance of locomotives and freight cars and owing to speed restrictions [slow orders] not envisaged by the schedule, as well as owing to the failure of stations, railroads and branches to accept trains.

The first place for the fulfillment of the schedule for the movement of passenger trains was awarded to the Transbaykal RR, which provided for 100 percent departure on schedule and a high level of running passenger trains on schedule, while the first place for the organization of freight train traffic was awarded to the Dnepr RR.

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## TRANSPORTATION

### RESULTS OF INCREASING WEIGHT OF TRAINS ON THE MOSCOW RAILROAD

Moscow GUDOK in Russian 2 Oct 79 p 2

[Article by S. Ayzinbud, professor at the Rostov Institute of Railroad Transport Engineers: "When the Weight of the Train is Increased"]

[Text] The innovation of the Muscovites, namely, running trains of increased weight and length, has brought forth a wide response throughout the entire network of railroads. It has found a mass of followers. Testifying to this are the numerous articles addressed to this matter by employees of the line, specialists and scientists on the pages of GUDOK, railroad newspapers and of technical and vocational and scientific journals. In the majority of instances, questions are raised in these materials that are connected with the technology of handling locomotives, the utilization of their special tractive features and the selection of the designed parameters for determining the weight of the train.

It is considerably less frequent that problems of the organization of the switching and advance movement of unit trains with larger loads and the questions of increasing the average-weighted weight of the train on the section and on the entire line are examined, and a poor job is being done of shedding light on the participation of sectorial services in the organization of work according to the new method. For, as you see, the innovation of the collectives of enterprises of the capital city's main line is also valuable in that the question of raising the carrying capacity of the sections by virtue of increasing the weight of consists and their length is being resolved in an over-all fashion.

Suggestions that have little justification are also heard at times in the total bulk of extremely interesting and useful articles addressed in support of the initiative of the Muscovites. Such proposals only serve to discredit the outstanding innovation of the Muscovites and their followers.

An article, "Problems of Increasing the Weight of Freight Trains," by Candidate of Technical Sciences A. M. Palikhov was published in the journal ZHELEZNO-DOROZHNYI TRANSPORT, No 7, 1979. Although adequately impressive in scope, it

pursues only one goal—how to make a locomotive pull a consist of a greater possible weight. To accomplish the task placed before him, the author rejects well-known criteria that determine the weight of a train, such as the heating-up of the traction motors, the rated traffic speed along a grade and average rated values of the coefficient of cohesion. He thinks it is possible to exceed critical weight norms and makes an appeal for this, without giving consideration to the fact that traction motors might be put out of operation. In his opinion, the restoration or rebuilding of them is not really such an expensive matter.

Further on the author, basing himself, as he writes, on "research that has been conducted," recommends the adoption "....as a system by which the weight of a train is established" a system that is such that all driving axles operate with some creeping and slipping when it is used. The author of the article canonizes as scientific dictum the recommendations cited and introduces new terminology such as: "system of multiple traction under extreme conditions," "wheel pair....will appear to vacillate upon cohesion."

This article misleads readers, while the solutions proposed by him witness to the fact that the author is off the track and is remote from science in his effort to solve the problem of running trains of increased weight and length. The appeals, such as "we think that in similar situations one must not always strive for a situation wherein, whatever might happen, one must protect a locomotive, after having requested an auxiliary one...." or "The fact in itself of the heating-up of engines cannot, in our opinion, be considered a criterion for determining the weight of a train" and similar ones made by him cannot be accepted and utilized in practice. The lifting of such restrictions in the selection of the rated tractive force for determining the weight of a train will lead not only to a growth in the failure of locomotives to operate, which will entail delays of trains and breakdowns in the traffic schedule.

At the same time, put another way, the questions raised could become the subject of useful discussion. Thus, it could be a matter of increasing the maximum permissible current in motors in connection with improving the system for their cooling. There is a real possibility of raising the theoretical values of the tractive force, which are limited by the adhesion of the wheels to the rails, but not at the cost of allowing slippage, but by means of realization of a higher coefficient of cohesion, if one applies stable anti-slippage devices and heightens the skill of locomotive brigades.

Under present operating conditions the weight of a freight train can and must be established not by the traction capabilities of an individual locomotive, but proceeding on the basis of the dimensions of the shipments being planned and the required carrying capacity of the line. The weight norm becomes a directive norm whose observance is dictated by the fulfillment of the state plan for freight shipments. Hence, the selection of certain scientifically sound technical and organizational measures to provide for the running of trains of the assigned weight is a task of traction estimates. And here it is necessary to regulate precisely what is what.

If the weight of a train is more than the standardized norm, but lower than the critical norm, then the skill of the locomotive engineer and excellent technical condition of the locomotive are required first and foremost to run it. If there then appears a need to run trains with a weight that is more than the critical norm, the implementation of a number of technical and organizational measures, such as the abolition of the required stop by the consist prior to steep grades, the use of slight pushing and of double traction and even the replacement of the locomotives by more powerful ones is needed.

One must take into account the fact that the measures under consideration are necessary not only to provide for the running of trains of increased weight, but also for sustaining scheduled running times along stretches between stations and along sections.

The theory of traction of trains enables one to establish a certain priority in the choice of technical and organizational means for each specific instance of running trains of increased weight. And it is here that the need to introduce a change in the Regulations for Traction Estimates is thrust upon us: one should entitle the section "Calculation of the Weight of a Train" "Selection of Measures for Running a Train of an Assigned Mass (Weight) Along a Specific Section of Track."

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## TRANSPORTATION

### TRACING RAILROAD CARS WITHOUT DOCUMENTS AND DOCUMENTS WITHOUT CARS

Moscow GUDOK in Russian 2 Oct 79 p 2

[Article by O. Burmistrova, deputy chief of the normative station for shipments of freight of the commercial administration, Moscow: "'Fugitives Without Passports'"]

[Text] The question of railroad cars without documents, the difficulties of establishing to whom they belong and the damage which the lengthy layover of such cars inflicts has been repeatedly raised on the pages of GUDOK. In order to speed up the search for the "passportless" rolling stock, some are suggesting the introduction of the long-forgotten notched wooded stick to serve as a tally, while others are proposing special "pockets" for documents.

But, you see, there exists a method which enables one to establish the ownership of such railroad cars or containers rapidly and without any additional expenditures. To do this, employees of the stations at which the railroad cars without documents or, vice versa, documents without railroad cars have been observed must send a telegram to a group at the Centralized Investigation Department, which functions in conjunction with the Main Freight Administration of the Ministry of Railways. Its telegraph address is "TSMNSP." We put these telegrams onto a card file and upon the availability of information on the railroad car and document on it, a telegram is sent on the following day in response to the matter of to whom the railroad car that has gone astray belongs.

It all seems very simple. But what does the actual state of affairs show? It was reported in the article, "Fugitives Without Passports," published in GUDOK No 64, that nearly 100 undocumented railroad cars lay idle at the Smela station on the Southern RR. After checking the card file at TSMNSP, we established that a total of six telegrams had arrived from Smela during this period. No reports had come in about the remaining incognito railroad cars—they just stood idle here while they blindly sought their owners.

The method of centralized search is simple, enables one to eliminate at the earliest possible date the results of defective work by the employees of technical offices and container platforms and speeds up the delivery of freight to



its destination. But success is guaranteed here only under the condition that one fully and promptly sends in information on railroad cars without documents.

Work is now being carried out on the introduction of a computer of a new generation to make the search for the "fugitives without passports" easier. It is true that trial experiments were carried out as early as several years ago. With the testing, however, a number of essential defects were ascertained. The basic defects were the step-by-step set-up in the transmission of search reports, the difficulty of coding and the lack of protection for the number of the railroad car and code of the station. Quite a bit of paper has been required in order to provide all the stations of the network with special journals with sample telegrams, which also entailed difficulties. Some increase in the staff has been required on a number of railroads in making the transition to the computer.

But this is not the chief concern. One must approach the problem of railroad cars without documents from another side—one must eradicate the separation of railroad cars from documents, and vice versa. For this it is necessary to improve the typing of waybills and to ease the work of employees of technical offices in the selection of documents. At the present time, commodities sheets are distributed at a number of stations on so-called "blind" forms, owing to a shortage of carbon paper, and they are filled out in a careless manner and by pencil, which also leads to confusion.

I would like to direct attention also to the work of formal documents-search groups at stations. As a rule, they are staffed with unskilled employees. Others won't go there to work—the wage rates are not high. Sometimes they keep goods receiving handlers at these posts, retaining their higher salaries with them. But, as you see, employees of the formal documents-search group must have knowledge far greater than that of goods receiving handlers, since they check the accuracy of the compilation of formal commercial documents and work with a clientele among whom people with a legal education are employed at a similar post.

What else engenders defective output in work? The answer is weak labor discipline and poorly organized technical training of employees. It is also necessary to direct the most serious attention to this aspect of the problem.

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